

## **A UK CONSENSUS ON OPTIMISING CVD SECONDARY PREVENTION CARE:**

### **PERSPECTIVES FROM MULTIDISCIPLINARY TEAM MEMBERS**

The ICON (Integrating Care Opportunities across the NHS) CVD Secondary Prevention

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**Abstract** (word count: 248 words)

Although overall cardiovascular (CV) mortality has declined in recent years, patients with clinically manifest cardiovascular disease (CVD) remain at increased risk of recurrent CV events. To minimise the likelihood of future CV events following an acute myocardial infarction (MI), changes in diet and lifestyle, alongside pharmaceutical interventions, such as dual antiplatelet therapy, a  $\beta$ -blocker, an ACE inhibitor, and a statin, are recommended within current clinical guidelines. The use of cardiac rehabilitation (CR) programmes has been shown to be highly effective in reducing mortality and morbidity following MI, and a cost-benefit analysis suggests that increasing the uptake of CR to 65% among eligible patient would result in potential cost savings of over £30 million annually for the NHS. The involvement of a multidisciplinary team (MDT) of healthcare professionals is central to delivering post-MI care, with initial and/or ongoing input from cardiologists, hospital-based specialist pharmacists, specialist nurses, GPs, dietitians, smoking cessation specialists and practice-based and community pharmacists, among others. This consensus statement was developed based on a meeting of HCPs actively involved in delivering CV secondary prevention care at primary and secondary care centres across the UK. Recognising that HCP team configuration and availability of resources/services vary by location, the authors have focused on three common themes which have broad relevance in CVD secondary prevention, specifically: integration of care, medicines optimisation, and encouraging patient activation. Opportunities for MDT members to improve outcomes in post-MI patients are suggested and examples of best practice models which have been implemented successfully are described.

**Keywords**

Cardiac rehabilitation; Cardiovascular Disease; Myocardial infarction; Heart failure; Risk factors; Clinical guidance

[Word count: 6,857 words (main body, excluding tables, figures and reference list)]

## INTRODUCTION

Although overall cardiovascular mortality has declined over previous decades, patients with clinically manifest cardiovascular diseases (CVD) remain at increased risk of recurrent cardiovascular (CV) events. Among patients who survive acute myocardial infarction (MI), 20% suffer a second CV event (non-fatal MI, non-fatal stroke, or CV-related death) within 1 year, while approximately 50% of major coronary events occur in those with a previous hospital discharge diagnosis of acute myocardial infarction (AMI).<sup>1</sup>

The substantially increased risk of further CV events in patients experiencing an initial event has led to the urgent prioritisation of measures for secondary prevention in CVD. Numerous clinical guidelines have been developed in an effort to improve secondary prevention in acute coronary syndromes (ACS) and heart failure (HF).<sup>2–5</sup> These guidelines universally include a requirement for changes in lifestyle, for example by promoting healthy eating, regular exercise and smoking cessation, alongside pharmaceutical interventions, such as antiplatelet drugs,  $\beta$ -blockers, angiotensin-converting enzyme (ACE) inhibitors and statins.<sup>2–5</sup> Such a multi-faceted approach to secondary prevention in CVD is known as cardiac rehabilitation (CR); a term which describes individualised and systematic strategies that aim to minimise the risk of recurrent cardiac events through a supervised, menu-based programme incorporating a number of components.<sup>6,7</sup> Post-MI care requires a mix of skills and expertise, so a multidisciplinary team (MDT) of healthcare professionals (HCPs) delivers this. The MDT may comprise cardiologists, hospital-based specialist pharmacists, specialist nurses, GPs, dietitians, smoking cessation specialists and practice-based and community pharmacists, among others. In addition to planning care based on recognised biomarkers for future CVD risk (e.g. high BMI, hypertension and/or dyslipidaemia), the MDT should not

overlook lifestyle elements which are major contributors to many primary and secondary CVD events (e.g. smoking, diet, inadequate levels of physical activity).

### **The benefits of CR programmes for patients and the NHS**

The use of CR programmes has been shown to be highly effective in reducing mortality and morbidity following MI. In a recent Cochrane meta-analysis of 63 studies, including 14,486 participants with median follow-up of 12 months, use of CR programmes was associated with a relative risk of 0.74 for CV mortality (95% confidence interval [CI]: 0.64, 0.86) and 0.82 for hospital admission (95% CI: 0.70, 0.96).<sup>8</sup> Of the 20 included studies reporting on quality of life, 14 showed higher levels of health-related quality of life in one or more domains following exercise-based CR compared with controls.

As well as improving outcomes for individual patients, evidence suggests that the effective delivery of CR may lead to significant cost savings that could be reinvested in rehabilitation and re-ablement. Indeed, one cost-benefit analysis reported that a 65% uptake for CR programmes would result in a reduction of 28,782 emergency cardiac readmissions in the following 12 months, leading to a potential cost saving of £30,646,085.<sup>6</sup>

### **Barriers to secondary prevention in CVD: Adherence to guidelines**

Despite the overwhelming evidence in favour of the effectiveness of CR programmes for patients with CVD, management of patients at risk of further CV events remains suboptimal.<sup>7</sup> This may be due to two overriding deficiencies: 1) gaps in current guidelines; and 2) discrepancies between recommendations and current practice. In terms of the first deficiency, a number of questions remain to be addressed in current guidelines for

secondary prevention in CVD, including the lack of understanding of the incidence of statin intolerance in the community, the impact of stopping statin therapy in elderly patients, the causality of the association between anxiety and CVD risk, as well as the health impact of e-cigarettes/vaporisers/electronic nicotine systems. Other issues yet to be resolved and addressed by guidelines include the most effective method for optimising blood pressure (BP) lowering in elderly, the threshold for hypertension intervention, and an understanding of the most effective diet for patients with pre-metabolic syndrome. Uncertainty about benefits of CR, or indeed perceptions that it may involve risk for a patient may therefore result in clinical inertia in terms of encouraging uptake among eligible patients.

Non-adherence to guidelines may be unintentional on the part of HCPs due to limited awareness of the most applicable clinical guidance. For example, within a CR programme a dietitian might deliver generic guidance based on the NHS Eatwell Guide, which provides recommendations for a healthy, balanced diet. Guidance on diet tailored more specifically for post-MI patients is available from NICE in CG172 (e.g. encouraging people to eat a Mediterranean-style diet [more bread, fruit, vegetables and fish; less meat; and replacing butter and cheese with products based on plant oils])<sup>2</sup>; whereas for a post-MI patient with type 2 diabetes, NICE guidance in NG28 should be consulted (e.g. this encourages consumption of high-fibre, low-glycaemic-index sources of carbohydrate in the diet, such as fruit, vegetables, wholegrains and pulses)<sup>9</sup>.

HCPs involved in prescribing secondary prevention medicines may also be failing to harness the full potential of these drugs by using suboptimal doses as recommended within guidelines. For example, only 16.3% of 270 patients attending a UK post-MI clinic were receiving a recommended ACE inhibitor/angiotensin receptor blocker (ARB) dose.<sup>10</sup>

## **Barriers to secondary prevention in CVD: Participation in CR programmes**

Arguably, the greatest barrier to the success of CR is its underutilisation and limited availability.<sup>7</sup> In Europe, it has been reported that only one place on a CR programme is available for every seven patients with coronary artery disease, translating into an unmet need of 3,449,460 places annually.<sup>11</sup> In the UK specifically, findings from the 2018 National Audit of Cardiac Rehabilitation (NACR) reported that although 76% of patients complete a CR programme, only 60% of the programmes on offer meet four to seven of seven defined service quality key performance indicators (KPIs).<sup>12</sup> Furthermore, certain patient groups seem to be particularly underrepresented, including women (accounting for only 29% of the population taking up CR), socially deprived groups (40% of people from areas of high deprivation start CR, compared with 54% from areas of low deprivation) and ethnic minorities (80.5% of patients attending CR are white British). In addition, very few patients with HF currently enrol on CR programmes.<sup>12</sup> To address these gaps in delivery, the 2018 NACR outlined a number of key recommendations, as summarised in Box 1.

<b>Box 1. Key recommendations from the NACR 2018 report for improving outcomes from CR programmes</b>
<ol style="list-style-type: none"><li>1. Recruit more female patients</li><li>2. Ensure that CR programmes are better tailored to the needs of female patients</li><li>3. Carry out a comprehensive CR assessment prior to, and on completion of, CR</li><li>4. Offer facilitated home-based modes of CR delivery for all CVD patients, including those with HF</li><li>5. Ensure programmes are working to certification standards and aim to secure certified status for the delivery of CR</li></ol>

Source: BHF 2018<sup>12</sup>

CR, cardiac rehabilitation; CVD, cardiovascular disease; HF, heart failure

Failures in the implementation of successful CR programmes are demonstrated by the 2015 EUROASPIRE IV study, a large cross-sectional study undertaken at 78 centres in 24 European countries.<sup>13</sup> EUROASPIRE IV showed that CVD risk factor management remains suboptimal for many patients, with a large majority of coronary patients failing to achieve the guideline standards for secondary prevention. The study reported 16% of patients continued to smoke cigarettes, 60% undertook little or no physical activity, 38% were obese (BMI  $\geq 30$  kg/m<sup>2</sup>), 42.7% had elevated blood pressure, 80.5% had elevated low-density lipoprotein cholesterol (LDL-C) levels and 26.8% were diagnosed with diabetes. These findings suggest that risk factor control is inadequate despite high reported use of medications, and also reveal large variations in secondary prevention practice between centres.

### **How can secondary prevention in CVD be improved?**

Because of the current shortcomings in secondary prevention in CVD, including a lack of uptake of CR programmes, the European Society for Cardiology (ESC) published a call for action in 2016, setting out recommendations to address the known challenges.<sup>14</sup> These recommendations can be broadly grouped into the following themes: 1) Integration of care (including closer communication between patient and HCP, and among HCPs; 2) Medicines optimisation; and 3) Improved treatment adherence.

At a local level, many HCPs currently work in MDTs to try to improve care of patients with CVD by addressing the issues identified by the ESC call for action. This consensus document draws on the experiences of the authors, as active MDT members, and seeks to provide a

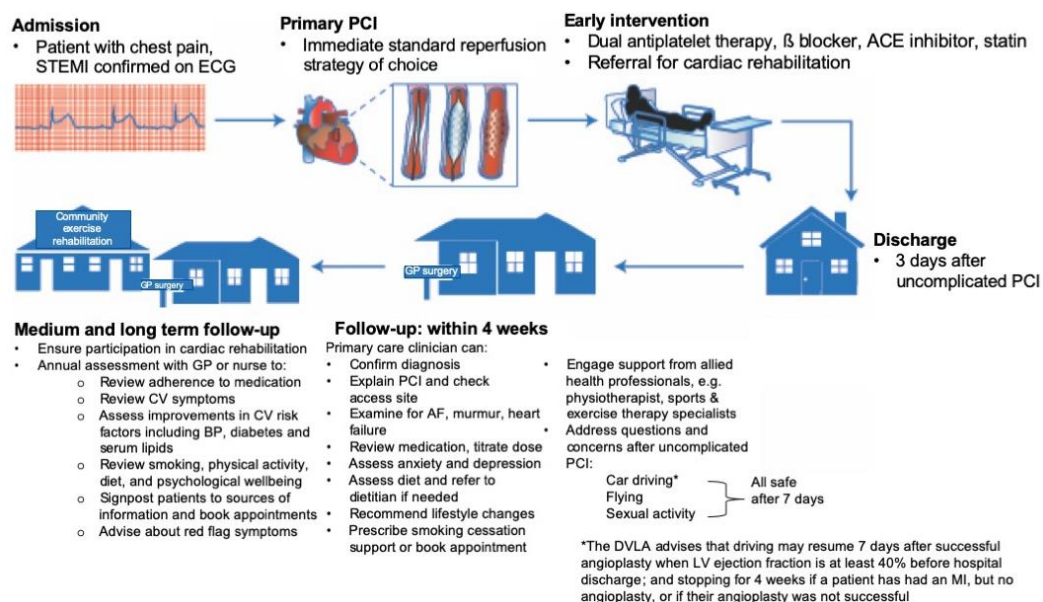


holistic perspective on CV secondary prevention models of care aligned with current clinical guidance and evidence-based medicine.

## OPPORTUNITIES FOR SECONDARY PREVENTION ALONG THE POST-MI PATHWAY

Although secondary prevention after MI has traditionally been divided into distinct phases including inpatient care, outpatient care and long-term intervention, in reality it should be considered a continuous lifelong process that follows the patient journey and allows them to return to a normal life.<sup>14</sup> A typical patient-treatment pathway for ST segment elevation myocardial infarction (STEMI) is shown in Figure 1, with a seamless transition from one stage to the next being essential.

**Figure 1. Management of post-STEMI patient: follow-up after PCI**



AF, atrial fibrillation; BP, blood pressure; DVLA, Driver and Vehicle Licensing Agency; ECG, electrocardiography; PCI, percutaneous coronary intervention; STEMI, ST-elevation myocardial infarction  
Figure adapted from Dalal et al, 2017<sup>15</sup>

Whereas managing the primary event is the first concern of emergency physicians, it is clear that secondary prevention should begin immediately following the MI. In the UK, nearly 90%

of patients who present with acute STEMI are treated with a primary angioplasty within 90 minutes of arrival at hospital.<sup>15</sup> Immediate pharmacological treatment consisting of dual antiplatelet therapy (aspirin plus a second antiplatelet agent), a  $\beta$ -blocker, ACE inhibitor and statin therapy should then be prescribed.<sup>2</sup> Patients are usually discharged 3 days after treatment for a STEMI with an uncomplicated primary PCI and are transferred to a wider primary healthcare team.<sup>15</sup> It is at this stage that CR has traditionally been offered to patients, sometimes as a 'nice-to-have' in addition to their pharmacological treatments. However, as the importance of CR programmes becomes increasingly clear, and as uptake of these programmes continues to stall, it becomes essential that they are presented as a vital part of an overall integrated rehabilitation programme. After an intervention, such as a PCI, the patient should understand that they are now beginning a long-term process of recovery and change focused on improving their future health and reducing their risk of a secondary event. Some patients may interpret the success of a procedure as being "curative", rather than understanding the longer-term implications of their MI and their ongoing cardiovascular risk.

As identified in the ESC's call for action, integration of care, including closer communication between patient and HCP and among HCPs, is essential for patient-centred CV secondary prevention, at all stages of the treatment pathway.<sup>14</sup> This cooperation should begin before the patient is discharged from hospital, to ensure that care is continued and maintained in the community. The British Heart Foundation (BHF) has funded and tested nine models of integrated care to tackle CVD in the UK.<sup>16</sup> Implementing integrated care using these models led to:

- Improved patient access to care and quality of life
- Provision of care outside of hospitals and closer to home

- HCPs working across organisational boundaries to better support the needs of patients and their families
- A more cohesive care journey, reduced hospital admissions and the generation of cost savings and productivity gains

Although variations exist in terms of local healthcare resources and team configuration, delivery of post-MI care by an MDT provides numerous opportunities for each HCP involved to support patients with the aim of improving future health outcomes (Table 1 provides examples). The roles and skills of the different MDT members involved often overlap, so areas which can and should be delivered by all team members are shown first (and in red).

**Table 1. Opportunities for MDT members to improve post-MI CR outcomes (as roles often overlap, examples of areas relevant to all MDT members are also included [shown in red])**

MDT member(s)	Steps that can be taken to improve patient outcomes (these steps are usually not exclusive to a single type of MDT member, those in red can be performed by anyone in the MDT)
<u>ALL members</u>	<p>Make every contact count</p> <ul style="list-style-type: none"> <li>• Address patient misconceptions about health and develop the patient's self-efficacy (e.g. enhance understanding that their condition is chronic and not "cured" at discharge)</li> <li>• Act as "CR champions" to raise patient confidence in the pathway and other HCPs; emphasise that other MDT members and services share same goal</li> <li>• Support CR delivery and encourage participation in CR</li> <li>• Support long-term follow-up of patient by monitoring and minimising CV risk factors</li> <li>• Assess attitudes to lifestyle change; deliver and reinforce CR messages to educate patient on diet, lifestyle and smoking</li> <li>• Assess attitudes to medication, medicines tolerance and adherence, and medication taking behaviour</li> </ul>
Cardiologist	<ul style="list-style-type: none"> <li>• Reinforce value of lifestyle changes and reducing CV risk factors</li> <li>• Provide specialist expertise to support medication reviews</li> <li>• Adopt technology solutions (e.g., offering video consultations) to increase capacity and accessibility of cardiology clinics as part of follow-up)</li> </ul>
Hospital-based CV specialist pharmacist	<ul style="list-style-type: none"> <li>• Support patients with co-morbidities and medication issues, e.g. pain management (if medicines were stopped during hospital stay), managing diabetes medicines, and other medicines optimisation issues in the complex post-MI patients who are often have co-morbidities</li> <li>• Act as "Medicines experts", supporting others in the MDT team with medicines-related issues</li> <li>• Reconcile medicines and identify adherence issues at admission</li> <li>• Initiate and titrate secondary prevention medications during hospital stay and outpatient clinics where applicable</li> <li>• Ensure discharge summary is detailed/complete and available to MDT members in primary care – use 'Electronic transfer of care' where available</li> <li>• Educate patients on CVD risk factors and how medicines help optimise these</li> <li>• Refer patients to community/GP practice-based pharmacy for NMS and SMR (supporting appropriate titration, and adherence over time)</li> </ul>
GP	<ul style="list-style-type: none"> <li>• Use relationship to address patient concerns about CR/medication, risk of future CV events</li> <li>• Identify and manage co-morbidities in CVD patients, e.g. HF</li> <li>• Arrange referrals to specialist care/local support, e.g. for smoking cessation</li> <li>• Organise annual reviews and follow-up</li> </ul>
Nurse CR/CVD specialist	<ul style="list-style-type: none"> <li>• Explain the meaning of blood tests and other test results</li> <li>• Act as HCP prescribers within CR team to help achieve targets for CVD risk factor control</li> <li>• Apply behaviour change models to the care delivered and use effective communication skills, e.g. motivational interviewing, to support patient engagement and motivation</li> <li>• Support delivery of comprehensive, individualised and menu-driven CR programmes that meet BACPR standards, including smoking cessation as a priority</li> <li>• Ensure timely referrals to other HCPs and service providers, e.g. smoking cessation</li> </ul>

	<ul style="list-style-type: none"> <li>• Support seamless transition to long-term management</li> </ul>
Community or practice-based pharmacist	<ul style="list-style-type: none"> <li>• Reinforce consistent CR programme messages about healthy lifestyle, CVD risk reduction</li> <li>• Provide easy to access support (e.g. there are 1.6 million visits per day to UK community pharmacies; many are open at evenings and/or weekends)</li> <li>• Assist in detection of CVD (through NHS Health checks, BP and HbA<sub>1c</sub> checks and AF case-finding using new technologies) and in management by supporting healthy lifestyles (diet, exercise, smoking cessation, weight management programmes, signposting to local support)</li> <li>• Act as pharmacist prescribers managing long-term conditions and through disease monitoring (blood pressure, HbA<sub>1c</sub>, INR) and through offering adherence support through the NMS/SMR</li> <li>• Practice-based pharmacists can support patient audits, CVD case-finding</li> <li>• Support and encourage patients to attend CR</li> </ul>
Registered dietitian (RD)	<ul style="list-style-type: none"> <li>• See patients at key (or ideally, at all) phases of CR to ensure adherence to dietary changes</li> <li>• Support and sustain behaviour change</li> <li>• Help support physical activity and improvements in strength through combined exercise and nutrition (especially as change in strength is a powerful predictor of mortality post-MI)</li> <li>• Identify and prevent malnutrition</li> <li>• Potential to assist with monitoring medications (if qualified as a supplementary prescriber)</li> </ul>
Physiotherapist/exercise specialist	<ul style="list-style-type: none"> <li>• Develop individualised exercise plan and goals, e.g. taking account of comorbidities such as arthritis, stroke and respiratory problems</li> <li>• Support return to work and self-management of the condition</li> <li>• Potential to assist with monitoring medications (if qualified as a supplementary prescriber)</li> </ul>

AF, atrial fibrillation; BP, blood pressure; CR, cardiac rehabilitation; CV, cardiovascular; CVD, cardiovascular disease; GP, General practitioner; HF, heart failure; HbA<sub>1c</sub>, glycosylated haemoglobin; INR, International Normalised Ratio; SMR, Structured Medication Review; NMS, New Medicine Service

\*The examples in the table are not exhaustive lists – the MDT skillset and pathway can vary in different regions, so HCPs may take on more or less activity in support of their post-MI pathway locally.

Over the medium- and long-term follow-up, the need for medicines optimisation becomes increasingly important. Guidelines recommend ongoing monitoring and titration of medications for secondary prevention in CVD, as well as the need to review continuing the antiplatelet and  $\beta$ -blocker therapy beyond 1 year.<sup>2</sup> However, there is considerable evidence to show that opportunities are frequently missed by not prescribing secondary prevention medicines at optimal doses.<sup>10</sup> For example, one UK-based study found that more than 25% of patients with pre-existing coronary heart disease who were readmitted with an ACS were receiving a suboptimal secondary prevention drug regimen at time of admission, with many of those patients failing to achieve cholesterol and blood pressure targets.<sup>17</sup> A medicines

optimisation and patient adherence strategy based on a cooperation between HCPs can improve both adherence and outcomes post-MI.<sup>10</sup>

Similarly, adherence to medication regimens is essential during medium- and long-term follow-up after MI.<sup>18</sup> Non-adherence to statins in the 12 months following an MI is associated with a 12% to 25% increased hazard for mortality<sup>19</sup>, while 1-year survival reduces from 98% to 89% within the first year after MI in patients discontinuing aspirin, statin and  $\beta$ -blockers<sup>20</sup>. Despite the evidence for the importance of adherence to medication following an MI, data suggests that medication adherence is highly variable and often suboptimal.<sup>18,21</sup> Within a recent UK postal survey of patients with CAD treated at a secondary/tertiary care centre, 43.5% of patients were found to be non-adherent for at least one of their secondary prevention medicines. In the non-adherent patients, 30.8% reported this was at least partly intentional. Overall, forgetfulness, concerns about the medicines doing more harm than good, and feeling hassled about medicines, were the main barriers reported by patients. These findings show that HCPs should explore their patients' beliefs and experiences with their medicines and tailor adherence interventions individually to overcome such barriers.<sup>21</sup>

## **PRIORITIES AT EACH STEP OF THE PATHWAY**

At each step of the patient-treatment pathway, priorities may change once the immediate aftermath of the MI is addressed and a more long-term focus becomes more important. At admission, the immediate priority is for reperfusion, confirmation of diagnosis and stabilisation of the patient.<sup>22</sup> Once these have been achieved, other priorities become more relevant. Key priorities in the early stages following an event are to address cardiovascular

risk factors, modify unhealthy lifestyle and diet issues, avoid future events and optimise patient engagement. In practical terms, this may mean the following interventions will be required.

### **1. Encouraging smoking cessation**

For CVD patients who smoke, quitting is an urgent priority and all members of the MDT (including hospital- and GP clinic-/community-based HCPs) should actively support this goal. Results of a 2003 systematic review indicated that quitting smoking after AMI or cardiac surgery can decrease the risk of death by at least one third<sup>23</sup>, while the risk of AMI has been shown to be significantly reduced within a few years of quitting<sup>24</sup>. Cessation also significantly reduces the risk of recurrent cardiac arrest.<sup>25</sup> The NHS Long Term Plan for 2019/20 to 2023/4 includes plans to offer support to stop smoking to all smokers who are admitted to hospital, and the government has recently set out its ambition for the UK to eliminate smoking by 2030 in a green paper focusing on disease prevention.<sup>26</sup>

In contrast to other areas of clinical care for post-MI patients such as managing type 2 diabetes, where there is a clear pathway for referrals and collaborative working with other HCPs, for smoking cessation, HCPs may limit their input to signposting their patient to a local support group without further follow-up. Smokers are up to four times more likely to quit successfully if they use a combination of stop smoking medicine and specialist help and support from the NHS.<sup>27</sup> MDT members can help patients to achieve this by booking an appointment with a local behavioural support group, providing very brief advice, or actively prescribing one of the approved evidence-based cessation pharmacotherapies (bupropion, varenicline or nicotine replacement therapy [NRT]).<sup>28</sup> A large randomised placebo- and

active-controlled clinical study, Evaluating Adverse Events in a Global Smoking Cessation Study [EAGLES], has demonstrated that these pharmacotherapies (bupropion, varenicline and NRT) do not increase the risk of serious CV events in the general population of smokers.<sup>29</sup> Separate analysis from the EAGLES trial found there was no significant increase in neuropsychiatric adverse events attributable to varenicline or bupropion relative to nicotine patch or placebo. Varenicline was more effective than placebo, nicotine patch, and bupropion in helping smokers achieve abstinence, whereas bupropion and nicotine patch were more effective than placebo.<sup>30</sup> Overall, these data provide reassurance that these therapies provide safe and effective options to increase a patient's likelihood of success in quitting.

Patients who are not ready to quit should still be provided with encouragement to do so and given an understanding of the health benefits they may expect from this. If patients have concerns about quitting, for example if they view nicotine intake as a coping mechanism for stress, or that they may gain weight, these should be addressed and appropriate support strategies offered, e.g. dietary advice, behavioural support on stress management, advice on how to optimise use of different NRT patches to provide background nicotine versus use of NRT gum/lozenges/mist products to provide rapid relief of cravings.

The National Centre for Smoking Cessation and Training (NCSCT) provides a training module on very brief advice for HCPs to offer patients ([https://www.ncsct.co.uk/publication\\_very-brief-advice.php](https://www.ncsct.co.uk/publication_very-brief-advice.php)) and other resources to support the delivery of smoking cessation interventions by the NHS and Local Authorities. Even brief and simple advice given by a



physician can increase unassisted quit rate by 1–3%<sup>31</sup>, so referral to a dedicated programme can have a significant impact on smoking rates.

## **2. Promoting participation in a tailored CR programme**

The NHS Long Term Plan recognises that uptake of CR across England is currently suboptimal (only 62,822 or 52% of the 121,500 eligible patients per year take up offers of CR.<sup>32</sup> Under this plan, scaling up and improving marketing of CR to be amongst the best in Europe aims to ensure that 85% of eligible patients access CR, which will prevent up to 23,000 premature deaths and 50,000 acute admissions over 10 years.

CR programmes used to be viewed by some HCPs as a bolt-on to prescribed drug regimens. However, they are now very much recognised as being part of an integrated care package, including lifestyle modifications and pharmacological treatments. Examples of different CR programmes are described in the section below, and interventions such as these should be offered to patients as part of an overall treatment strategy. Rather than providing a traditional/‘one-size-fits-all’ programme, the format should offer an individualised, menu-based approach, tailored to the patient’s preferences and abilities, for example working-age patients may prefer online/home-based follow-up over attendance at group-based CR sessions, uptake may be enhanced in some communities by offering translated versions of materials and/or interpreter support. Digital options such as app-based and web-based online platforms for remote monitoring could also help in increasing uptake. For example, Activate Your Heart is an interactive web-based CR service currently being trialled in 250 patients in Scotland – the programme offers 24/7 access to classes through patients’ computers or mobile devices, cutting out the need to travel to appointments at fixed times

and locations.<sup>33</sup> The appeal of these options is not restricted to working age patients – they could be convenient for those living in rural areas and preferred if anyone does not like group-based activities.

An opportunity to engage with CR may be missed if there is inadequate handover to the primary care team when a patient is discharged from the hospital. If the patient leaves without fully understanding the scope of the support available, they may revert to old habits, and visit a GP infrequently. It is therefore essential that patients be introduced to a CR programme prior to leaving hospital, and that they be rapidly followed up on returning home. Following an MI, a patient may be receptive to the message that although their CV event has been managed, their future risk for CVD is significantly elevated and therefore steps to manage this risk need to start now and continue in the future. The information conveyed should be kept as concise and clear as possible to avoid overloading the patient who is still in the early phase of recovery from a traumatic experience.

It is also important that the patient continues to receive ongoing care and contact from the CR support team throughout their recovery. It is very easy for patients to fall back into old habits during recovery, particularly when they start to feel better, and there must be ongoing interventions to ensure that the lifestyle changes continue to be adopted.

### **3. Arranging follow-up cardiac imaging**

After MI, optimal clinical management depends critically on cardiac imaging. In the acute (0 to 48 hours post-event) and subacute (3 to 7 days post-event), cardiac imaging is performed using echocardiography.<sup>34</sup> This imaging assesses segmental and overall ventricular systolic

function, intracavity thrombus formation, and other mechanical complications of MI. An echo is recommended within 24–48 hours of MI and an additional echo is recommended within the first 3 months after infarction to provide a post-infarction baseline assessment of function.<sup>34</sup> HF is a major cause of late morbidity and mortality after MI, however cardiac imaging and other approaches for early identification of patients at risk of HF are currently poorly integrated.<sup>35</sup>

For patients who have had an acute MI and who have symptoms and/or signs of heart failure and left ventricular systolic dysfunction, NICE recommends initiating treatment with an aldosterone antagonist licensed for post-MI treatment within 3–14 days of the MI, preferably after ACE inhibitor therapy.<sup>2</sup> However, a recent UK study found that prior to a medicines optimisation review, only 60.5% of post-MI patients who were suitable for eplerenone had been initiated on this medicine.<sup>10</sup>

#### **4. Promoting healthy lifestyle behaviours**

Nutrition and lifestyle have a central role in both the primary and secondary prevention of CVD, and is reflected in national<sup>2,36</sup> and international guidelines.<sup>4,37</sup> The primary reason for this is that so many of the established risk factors for CVD such as dyslipidaemia, hypertension, obesity, and type 2 diabetes are all heavily influenced by diet.<sup>38</sup> Current NACR data show the relatively poor impact that CR currently has on reducing body mass index (BMI), and the relatively small gains that are seen in the number of patients achieving total and LDL cholesterol, and hypertension targets.<sup>12</sup> These beneficial changes are likely primarily due to the intensive pharmacotherapy that these patients are prescribed post

cardiac event, and that such changes in BMI, lipids, and BP may be even greater if lifestyle is adequately addressed.

Modest weight loss of 5–10% can have a substantial impact on both physical and metabolic consequences of obesity<sup>39</sup>, however it is ideal that weight loss is excess fat tissue, and not muscle. Recent data has shown that BMI is a weak predictor of major adverse cardiovascular events (MACE) in post-MI patients, and body fat and fat free mass are superior.<sup>40</sup> Therefore, whilst BMI is an easy measure to perform, additional measures that accurately look at body composition may aid in weight management during CR. It is important to note that weight management can also mean supporting patients to maintain or gain weight if needed. In a study of 174 elderly patients admitted for acute MI, a greater degree of malnutrition was associated with a significantly increased risk of all-cause mortality.<sup>41</sup> The implications for CR are substantial, and AMI patients who are underweight on admission should be seen by a dietitian prior to discharge.

There is an ongoing debate regarding the best diets for weight loss (low carbohydrate or low calorie). This was addressed by DIETFITS showing that similar calorie reductions from either a low fat or low carbohydrate lead to weight loss and similar improvements in blood pressure, fasting insulin, and fasting glucose.<sup>42</sup> Manipulating the nutrient composition can provide added benefit in improving CV risk factors such as BP, glucose, and lipids. The large PREDIMED multicentre trial in Spain randomised 7,447 individuals who were at high CV risk to a Mediterranean diet supplemented with extra-virgin olive oil, a Mediterranean diet supplemented with mixed nuts, or a control diet (advice to reduce dietary fat).<sup>43</sup> The incidence of major CV events was lower among those assigned to a Mediterranean diet

supplemented with extra-virgin olive oil or nuts than among those assigned to a reduced-fat diet, demonstrating that diets differ in their extent of cardioprotection. Studies such as these reinforce that it is not sufficient to deliver generic healthy eating advice in CR, other than as a foundation to build on. Patients require careful education around dietary fats, sources, and also nomenclature (saturated, unsaturated, and types of fat such as hydrogenated vegetable oil). This education can also help to empower patients to understand food labels and give them confidence to make cardioprotective food choices, in line with JBS3 recommendations to “avoid/reduce consumption of calorie rich but nutritionally poor snacks”.<sup>44</sup> Any HCP working in this area should have a broad understanding of nutrition and be able to refer on to dietitians for more complicated issues.

Advice regarding how to implement any changes to diet must be carefully tailored to each individual patient, accounting for differences in taste, cooking skills and facilities, educational level, and their understanding of the importance of good nutrition. As CVD is more common in individuals with lower educational attainment and socioeconomic status<sup>45</sup>, care must be taken not to make lifestyle changes impossible to follow. Knowing patients' circumstances outside of the CR location can make a substantial impact on the quality of nutritional advice provided. Familiarity with affordable alternatives is essential, e.g. considering tinned sardines or mackerel as an alternative to fresh salmon.

## **5. Regular medication review and medicines optimisation**

As discussed previously, ongoing monitoring and titration of medications for secondary prevention in CVD, as well as the need to review continuing the antiplatelet and  $\beta$ -blocker therapy beyond 1 year are recommended in current clinical guidance.<sup>2</sup> Regular review of

the patient's medication needs allows their regimen to be adjusted as appropriate e.g. to up-titrate medicines optimise efficacy and to meet targets for cholesterol levels, blood pressure and HbA<sub>1c</sub>. It may also be appropriate to reduce or replace medications if a patient's needs have changed, for example if their level of liver or renal function has changed over time affecting clearance of medicines they are taking. In line with NICE guidance adherence should also be assessed and any patient concerns about their medication addressed.<sup>46</sup>

In a recent prospective, controlled feasibility/pilot study in London, the impact of a pharmacy care intervention on adherence to medication and on health outcomes was explored in patients with ACS.<sup>47</sup> Community pharmacists delivered an intervention involving a 15 to 20-minute motivational interview to the patients, either face-to-face or by telephone. After 6 months, self-reported medication adherence among those receiving motivational support from community pharmacist was 17% greater than that recorded in control patients. As improved adherence to secondary prevention medication for coronary heart disease would promote better clinical outcomes, the study demonstrates the feasibility and value of interventions by pharmacists and other MDT members to support adherence. In the following section covering models of best practice, further examples of medicines review, and medicines optimisation are discussed.

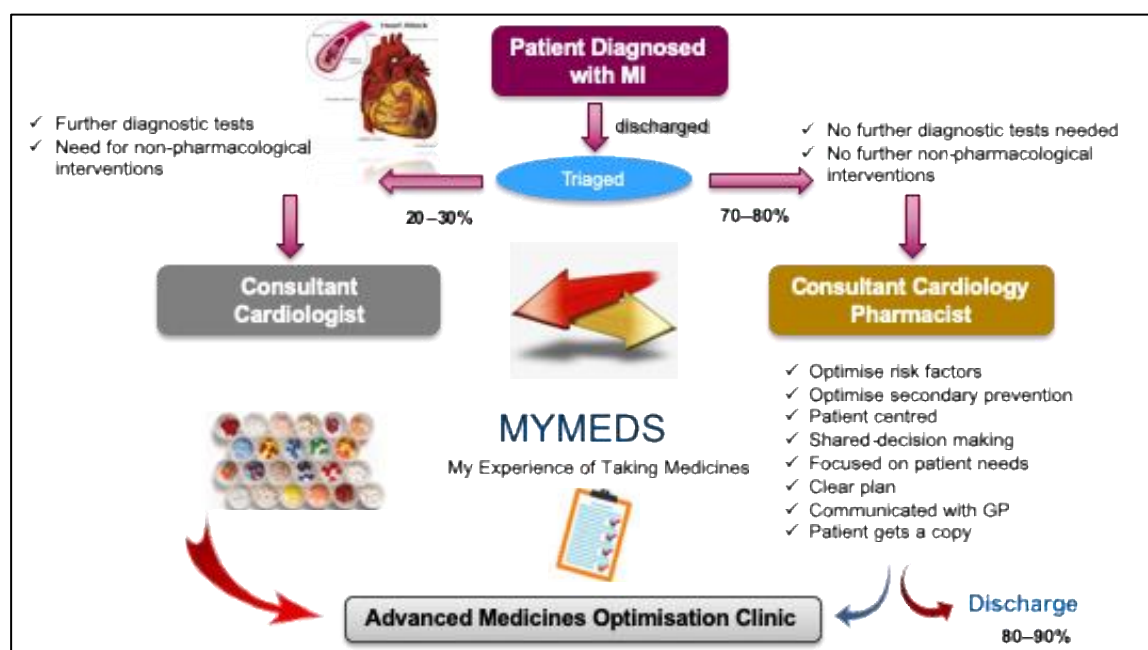
## **EXAMPLES OF BEST PRACTICE AND FUTURE TRENDS**

This section discusses examples of current best practice and trends regarding optimisation of care in CVD across a variety of models and locations in the UK. These models are based on the experience of the authors and provide examples that may be applicable to other regions in the UK.

## Hospital-based post-MI medicines optimisation: A joint consultant pharmacist and cardiologist clinic model

Post-MI patients at Leeds Teaching Hospitals NHS Trust are offered the opportunity to join the Leeds Medicines Optimisation Clinic Project.<sup>10</sup> In this model, patients typically have a short stay in hospital (around 2.5 days), then are seen by the CR team in hospital immediately before discharge to receive initial advice and for a handover to the CR team in the community. After discharge, patients return to the hospital to attend this clinic, and are then followed up by community-based nurses for CR care. The process is illustrated in Figure 2.

**Figure 2. The Leeds Universities post-MI medicines optimisation programme**



GP, general practitioner; MI, myocardial infarction

All team members adopt a person-centred approach in the clinic and innovative new tools such as the MYMEDS questionnaire are used to explore for modifiable barriers to

adherence. Where needed, patients can also be referred to statin-intolerance and PCSK9i clinics as part of the pathway. The improved optimisation of therapy has demonstrated improvement in adherence and better outcomes post-MI.<sup>10</sup>

The Leeds post-MI pathway is a 12-month process rather than the more typical 3-month programme and culminates in a virtual 12-month review performed by the specialist with access to key details (current medicines, test results, ongoing concerns) to assess CV risk factors and medicines optimisation. This review provides a recommendation back to the patient's GP or practice-based pharmacist regarding whether the criteria to continue antiplatelet therapy are met, and the final decision is made in consultation with the patient.

The integration between primary and secondary cardiac care offered by this model assists GPs who may lack confidence or require additional support when making treatment decisions. Indeed, although GPs in Leeds can make the decision to continue antiplatelet therapy if they feel confident to do so, there is a specialised review service available if GPs have any concerns or if the case is particularly complex. The antiplatelet review service is a virtual review service carried out by the hospital pharmacy team, an interventionalist and a general cardiologist. This close working arrangement also offers support to pharmacists in primary care who may be concerned about having to make a decision regarding continuation of antiplatelet therapy at 12 months. Patients also feel more reassured by dealing with HCPs (e.g. a pharmacist) if they are presented as part of a CR team, working in partnership with their cardiologist, particularly when they show knowledge of what the patient has been through and are not just focused on a particular issue (e.g. recapping the patient's medical history in the first meeting). Pharmacists benefit too, with research



showing that practice-based pharmacists involved in this process feel much more integrated within the team compared with community-based pharmacists who may feel outside the system.

To enhance this model further, work is currently ongoing on an IT system to flag suboptimal medicines and/or CV risk factor management, to allow the patient to be referred back to their GP to address issues identified in the 12-month review.

The Leeds medicines optimisation model can be used in secondary or primary care-based pharmacy teams. As only 42% of 302 audited CR schemes currently have pharmacist involvement<sup>12</sup>, there is a great opportunity to increase their role in this way, particularly as many pharmacists become qualified as prescribers.

### **Integrated community-based CVD prevention: MyAction nurse-led programme**

MyAction is an integrated community-based nurse-led CV prevention programme. In this model, an MDT consisting of CV nurses, dieticians, physical activity specialists, and administrative staff supported centrally by a lead nurse, clinical psychologist and consultant cardiologist offer support to patients with established CVD or who are at high multifactorial risk for CVD over a 12-week period.<sup>48</sup> As well as a standard clinical assessment, the initial patient review includes patient-reported outcome measures, defining patient priorities in terms of reducing their CV risk, as well as an exploration of patient beliefs, barriers and motivators to change. The 12-week programme includes an individualised follow-up and a weekly educational workshop and supervised exercise session. CV risk factor management is assessed at a weekly meeting held between the MDT and cardiologist, and therapeutic decisions are communicated to the primary care practitioner. After programme completion,

the patients undergo an end-of-programme assessment, with a further assessment at 1 year.

The results of this programme are striking, with significant reductions found in levels of smoking, as well as significant increases in the proportions of patients achieving fitness, blood pressure and LDL-C targets. Adherence to statins and antihypertensive medications is also substantially increased, while significant improvements in depression scores and quality-of-life measures have been seen. The majority of improvements are maintained at 1-year follow-up.<sup>48</sup>

### **Improving diagnosis and management of HF: A one-stop specialist GP clinic model**

In the UK, 580,000 people are on their GP's HF register.<sup>49</sup> However as many as 920,000 people are living with HF when hospital diagnoses are included<sup>50</sup>, suggesting that there are barriers to accurate diagnosis of chronic HF within primary care. A one-stop diagnostic clinic model for HF that has been used in the NHS Darlington Clinical Commissioning Group since 2002 has proven to be highly effective<sup>51</sup>, achieving a higher percentage of patients with HF due to left ventricular systolic dysfunction who are treated with ACE-inhibitors/ARBs and  $\beta$ -blockers than demographically similar CCGs.<sup>52</sup> This model integrates GP specialist, HF nurse input in primary care with a cardiologist's hospital-based clinic. Patients are referred to CR where appropriate.

In a qualitative study in 2003, reasons why GPs had not implemented best evidence in the diagnosis and management of HF were identified.<sup>53</sup> At that time, key barriers included a lack of confidence in diagnosis and management, a lack of awareness of the relevant evidence base for care, and variation in GPs' personal preferences and organisational care pathways.

Ten years later, a national survey found that reported differences in the way HF is diagnosed and managed had changed little in the past decade.<sup>54</sup> The finding that only 54.7% of the respondents (made up of GPs, n=251; cardiologists, n=103; general physicians n=54; and HF nurses, n=78) had access to rehabilitation for their HF patients suggests that greater access to CR programmes is needed.

### **Offering CR format options: Home-based programmes**

As the requirement to attend regular sessions at a hospital or other venue for group-based CR programmes may act as a barrier to participation, home-based schemes may offer a viable and more accessible alternative. NHS Lothian is responsible for the Heart Manual, a home-based CR programme facilitated by HCPs which has been used across the UK to support individuals recovering from MI and revascularisation. This programme was first reported in 1992 and was demonstrated to be as effective as a hospital-based regimen in improving CV health following an AMI.<sup>55</sup> In a recent update on this programme, patients reported that having a comprehensive programme, which combined several themes, was the most beneficial aid to their recovery.<sup>56</sup> The themes included (ranked from greatest to the least impact) were health behaviour change and modifiable risk factor reduction, psychosocial support, education, support, vocational rehabilitation, medical risk management and long-term strategies. Patients found that the programme has a profound impact on their daily lives and proved advantageous for CR.

For patients with HF, a home-based CR intervention facilitated by an HCP is also available.<sup>57</sup> The Rehabilitation EnAblement in CHronic Heart Failure (REACH-HF) intervention has been

shown to be clinically superior in disease-specific health-related quality of life at 12 months and offers an affordable alternative to traditional centre-based programmes.<sup>57</sup>

### **Enhancing GP care for CVD: The role of Primary Care Networks**

The introduction of Primary Care Networks (PCNs) underway across England is expected to provide opportunities to improve post-MI care and help in detecting undiagnosed risk factors.<sup>58</sup> Although PCNs are not yet promoting CR, they will eventually be required to deliver a set of seven national service specifications, including areas of relevance to CVD. Five of the standards will start by April 2020: SMRs, enhanced health in care homes, anticipatory care (with community services), personalised care and supporting early cancer diagnosis. The remaining two will start by 2021: CVD case-finding and locally agreed action to tackle inequalities.<sup>58</sup>

PCNs are highlighted in the recently published 5-year framework for the GP contract reform as “an essential building block of every Integrated Care System”<sup>59</sup> and, over time, patients should benefit from improved access to specialist HCP expertise and facilities through pooling of resources and staff among GPs practices within PCNs.

### **Community and Practice-based Pharmacy: Supporting medication adherence and CVD risk factor management**

The New Medicines Service (NMS) provides support for people with long-term conditions newly prescribed a medicine in order to try to improve treatment adherence. The scheme is provided by more than 90% of community pharmacies.<sup>60</sup> Patients on multiple medicines, particularly those receiving medicines for long-term conditions may also benefit from

Structured Medication Reviews (SMRs) (under the NHS Long Term Plan for 2019/20 to 2023/4, SMRs carried out by pharmacists working within PCNs as part of the new GP contract arrangements will be phased in to replace the Medicines Use Review (MUR) services provided by pharmacists).<sup>61</sup> The SMR is a critical examination of a person's medicines with the objective of reaching an agreement with the person about treatment, optimising the impact of medicines, minimising the number of medication-related problems and reducing waste.

Information from the pharmacist-led SMR should be provided to the patient's GP where there is an issue for them to consider. The frequency of medication reviews should be based on the health and care needs of the person. Safety should be the most important factor when deciding how often to do the review and the frequency should be recorded in the patient's care plan.

Practice-based and community pharmacies can also support post-MI patients with self-management of CVD risk factors, e.g. by providing advice on smoking cessation or weight control, and can also help identify patients with elevated CVD risk, e.g. through screening programmes, such as the NHS HealthCheck, or point of care testing for QRISK® score.

### **Encouraging patient engagement in deprived areas: Partnering with community organisations**

The UK's life expectancy is below that of many comparator countries, especially for women, for whom there has been no improvement since 2011. Inequalities are widening, and the UK's healthcare expenditure and resources are below those of comparator countries.<sup>62</sup>

Deprivation adversely affects patient engagement in healthcare, as exemplified by the fact that uptake of the NHS Health Check is higher in more affluent areas. This is particularly the case where English may not be the first language spoken in all families. It is essential, therefore, to ensure that patients living in less affluent areas have the same access to support services in secondary CV prevention as their wealthier neighbours in other districts. Attempts have been made to achieve this goal in East London, where a community-based atrial fibrillation (AF) screening service has been established.<sup>63</sup> In this project, a specialist anticoagulation pharmacist who is able to speak Hindi, Punjabi and Urdu held screening sessions in a South Asian community organisation and a Sikh temple. The programme was successful in detecting high-risk individuals, who do not frequently access healthcare, and provided screening within the familiar surroundings of local community organisations. The team behind the AF screening project is working with the local Council for Voluntary Services in order to establish an integrated care pathway.

### **Harnessing technology: Cardiologist consultations via video**

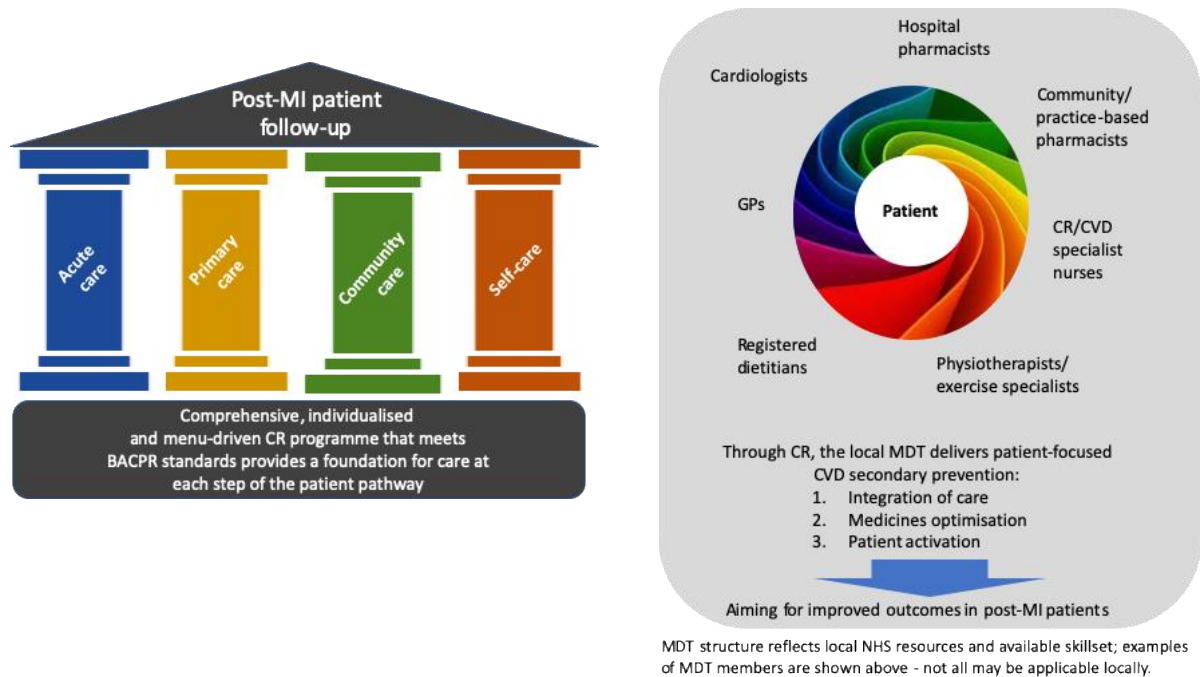
Travel to hospital to visit a consultant can be one barrier to patient access, as it requires time off work in some cases, or a difficult and uncomfortable journey in cases of more severely ill patients. In February 2019, Lewisham and Greenwich NHS Trust became the first NHS Trust in England to offer video consultations for cardiology patients, to allow access specialist advice without requirement for travel.<sup>64</sup> The consultations allow cardiologists to offer important expert advice and arrange further tests where necessary without the need for patients to return to the hospital, having already been seen in the emergency department. It will be interesting to observe whether implementation of this approach and other technology-based solutions enable greater capacity in cardiology clinics and reduce

the numbers of missed appointments, while increasing convenience for both HCPs and patients alike.

## **SUMMARY**

Secondary prevention in CVD offer significant benefits to patients in terms of reduced mortality, reduced morbidity and improved quality of life. However, due to shortcomings in the delivery of secondary prevention programmes, outcomes for patients with CVD are currently suboptimal in the UK. This consensus statement offers practical examples of the interventions that are required to deliver effective CR across all stages of the patient-treatment pathway following a cardiac event. In addition, a range of best practice models from across the UK that are currently achieving success in reducing CV risk are described and endorsed with a view to being adopted or adapted elsewhere. These include a pharmacist-led, hospital-based post-MI medicines optimisation programme, a nurse-led integrated community-based CVD prevention programme, and a GP-led one stop HF diagnosis and management clinic model for primary care. These models illustrate ways in which different HCPs involved in providing MDT care can work together to improve patient outcomes in CVD (Illustrated in Figure 3).

**Figure 3. Harnessing the skills and expertise of MDT through CR in patient-focused CVD secondary prevention**



MDT members are central to delivering CV secondary prevention care. Across the UK, they often work with local variations in team configuration and resource/services availability. The authors of this consensus statement wish to encourage greater integration of care through closer working between MDT members both within primary care, and between colleagues working in different settings. For example, cardiologists and specialist pharmacists in secondary care can offer valuable advice and support for primary care colleagues and vice versa. Individually, MDT members can identify and optimise opportunities for secondary CV prevention in their daily practice. Regardless of the MDT member's role or location, each HCP can actively work to optimise their patient care pathway and to reinforce patient activation. After a CV event, a patient must embark on a lifelong journey of change designed to minimise the risk of secondary events. Without ongoing support and understanding from their HCP, these changes may appear more daunting. For example, attempting smoking cessation without support is substantially less likely to succeed than an attempt with HCP



support. Similarly, promoting engagement with CR, ensuring the patient recognises the importance of adherence to medication, is encouraged to adopt healthy lifestyle behaviour, and understands the rationale for attending specialist follow-up appointments, for example for imaging, are opportunities for HCPs to reinforce the changes needed for the patient to minimise their future CVD risk.

Embracing the challenge of sub-optimal outcomes in CVD will also require HCPs to leverage potential benefits of changes in the NHS, for example the roll-out of PCNs, and to harness technology solutions which can provide greater flexibility for patients to engage in their healthcare, for example video consultations or home-based CR programmes. It is hoped that by focusing on integration of care, medicines optimisation and encouraging patient activation, the immediate and long-term outcomes can be improved for our patients following a CVD event.

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